

DETAILED ACTION

Applicant's arguments/remarks, filed on 5/2/08, have been fully acknowledged.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 2, 4-7 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Koerner et al. (US Pat. 4,137,179).

Claims 1, 2 and 4-7: Koerner et al. teaches a process for the production of an aqueous composition comprising organosiloxanes having amino groups attached to the silicon atoms (abstract). Koerner et al. further teaches that the compositions may be prepared by adding an aminotrialkoxysilane, such as 3-aminopropyltrimethoxysilane (3:40-41), to an emulsion of a dimethylpolysiloxane diol (2:46-51). The emulsion of the dimethylpolysiloxane diol may be prepared by taking an already prepared dimethylpolysiloxane diol of a desired viscosity, mixing with an emulsifier(s), and adding the mixture to water with vigorous stirring or adding water into the siloxane-emulsifier mixture. The homogenization of the mixture is prepared mechanically (2:63-3:3). Koerner et al. further teaches that the emulsifier may be a nonionic emulsifier or cationic emulsifier and that the emulsifier is added before the aminofunctional silane (3:4:12).

Claim 10: While Koerner et al. teaches in the embodiments that the polysiloxane diol is prepared via a base-catalyzed ring-opening polymerization of octamethylcyclotetrasiloxane (examples 1-3), Koerner et al. also teaches that instead of employing cyclic dimethylsiloxanes, dialkylsiloxanes may be employed as starting materials (3:24-28). Further, the suggestion to

employ an already prepared polysiloxane diol is made by Koerner et al. (2:66-68). This latter suggestion taught at 2:66-68 is a required limitation of instant claim 1. Therefore, Koerner et al. explicitly teaches two methods to prepare an aqueous emulsion comprising an aminofunctional silane and a dimethylpolysiloxane diol in which there is no added cyclic dimethyl siloxanes, and as such the amount of cyclic siloxanes present in the final emulsion would inherently be less than 2% as taught in some of the embodiments of Koerner et al., since no cyclic siloxane starting materials are deliberately added.

Claims 1, 2 and 4-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohashi et al. (US Pat. 5,236,465).

Ohashi et al. teaches a process for the preparation of an emulsion comprising mechanically emulsifying a silanol-functional polysiloxane in water in the presence of a cationic or nonionic surfactant (5:56-6:2 and 12:35-56). While the preparation of the silanol-functional polysiloxane is taught to involve the ring-opening polymerization of a cyclosiloxane in the presence of a basic catalyst, the final polysiloxane bearing silanol groups is neutralized and then emulsified in the absence of any catalyst as required by instant claim 1. The polysiloxane having silanol functionality, surfactant and water are mechanically emulsified (5:56-6:2). Ohashi et al. further teaches that an organofunctional silane, which includes 3-aminopropyltrimethoxysilane (8:34), is added along with a catalyst, which may be an amine salt (a basic catalyst), which promotes coupling/reaction of the silanol groups of the polymer with the alkoxy groups of the silane.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 3 is rejected under 35 U.S.C. 103(a) as being anticipated by Koerner et al. (US Pat. 4,137,179) as applied to claim 1 above, in view of Schirosi et al. (WO 02/42360).

Koerner et al. teaches a process for the preparation of polysiloxane emulsions of instant claim 1, as described above. Koerner et al. does not teach that the polysiloxane, surfactant and water are continuously fed to a high shear mixer forming a viscous oil in water emulsion which is diluted prior to the addition of the organosilane. However, Schirosi et al. does teach such a process (paragraphs 0024-0026). Koerner et al. and Schirosi et al. are combinable because they are from the same field of endeavor, namely, organopolysiloxane emulsions which are based on emulsion of polysiloxane diols in the presence of water and surfactant, followed by a chain extension reaction with an alkoxysilane. At the time of the invention, a person having ordinary skill in the art would have found it obvious to prepare the organofunctional polysiloxane emulsions as taught by Koerner et al. using the procedure as taught by Schirosi et al. and would have been motivated to do so because Schirosi et al. teaches that the process employed according to claim 3 is particularly suitable for the continuous emulsification of linear polydiorganosiloxanes, including those which have silanol groups (paragraph 0010). Further, a desired emulsion particle size can be maintained using the process described in Schirosi et al. (abstract).

Claim 11 is rejected under 35 U.S.C. 102(b) as being anticipated by Koerner et al. (US Pat. 4,137,179) in view of Schirosi et al. (WO 02/42360), as applied to claims 1 and 3 above, further in view of Dalle et al. (US Pat. 6,248,855).

Koerner et al., in view of Schirosi et al. collectively teach instant claims 1 and 3, as described above. Koerner et al. does not explicitly teach that the polysiloxane emulsion contains less than 2% of cyclic siloxanes. However, Dalle et al. teaches that the presence of volatile cyclic polydimethylsiloxanes (such as octamethylcyclotetrasiloxane), in commercially available materials is undesirable owing to recent safety and environmental guidelines (1:22-29). Koerner et al. and Dalle et al. are combinable because they are from the same field of endeavor, namely, the emulsion of polysiloxanes having organofunctional groups and subsequent chain extension reactions of the organofunctional polysiloxanes. At the time of the invention, a person having ordinary skill in the art would have found it obvious to keep the levels of cyclic volatile siloxanes as low as possible, preferably below 1% as taught by Dalle et al. when incorporating the process of Koerner et al. and would have been motivated to do so for the reasons taught by Dalle et al. cited above. This would include removal of any volatile and cyclic organosiloxanes prior to the emulsification step as taught by Koerner et al.

Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Ohashi et al. (US Pat. 5,236,465) as applied to claim 1 above, in view of Schirosi et al. (WO 02/42360).

Ohashi et al. teaches a process for the preparation of polysiloxane emulsions of instant claim 1, as described above. Ohashi et al. does not teach that the polysiloxane, surfactant and water are continuously fed to a high shear mixer forming a viscous oil in water emulsion which

is diluted prior to the addition of the organosilane. However, Schirosi et al. does teach such a process (paragraphs 0024-0026). Ohashi et al. and Schirosi et al. are combinable because they are from the same field of endeavor, namely, organopolysiloxane emulsions which are based on emulsion of polysiloxane diols in the presence of water and surfactant, followed by a chain extension reaction with an alkoxy silane. At the time of the invention, a person having ordinary skill in the art would have found it obvious to prepare the organofunctional polysiloxane emulsions as taught by Ohashi et al. using the procedure as taught by Schirosi et al. and would have been motivated to do so because Schirosi et al. teaches that the process employed according to claim 3 is particularly suitable for the continuous emulsification of linear polydiorganosiloxanes, including those which have silanol groups (paragraph 0010). Further, a desired emulsion particle size can be maintained using the process described in Schirosi et al. (abstract).

Claims 9 is rejected under 35 U.S.C. 103(a) as being anticipated by Ohashi et al. (US Pat. 5,236,465) as applied to claim 1 above.

Ohashi et al. teaches the process of instant claim 1, as described above. While Ohashi et al. does not explicitly teach the silane coupler and silanol polymer are reacted at a temperature of below 40 degrees C, it is nevertheless submitted by the Examiner that such a temperature range would be *prima facie* obvious. A person having ordinary skill in the art would, in the absence of a teaching regarding the temperature, would either assume that the temperature is room temperature or would at the very least carry out the taught reaction at room temperature as this comes with the most economical benefits and requires fewer process steps (i.e., heating and

cooling steps). Further, the reactions taught by Ohashi et al., such as the one taught at 11:19-20 are recognized by a person having ordinary skill in the art as being able to take place at room temperature. The reaction between a silanol and an alkoxysilane is generally facile, especially when using methoxysilanes as is the case with Ohashi et al.

Claim 11 is rejected under 35 U.S.C. 102(b) as being anticipated by Ohashi et al. (US Pat. 5,236,465) in view of Schirosi et al. (WO 02/42360), as applied to claims 1 and 3 above, further in view of Dalle et al. (US Pat. 6,248,855).

Ohashi et al., in view of Schirosi et al. collectively teach instant claims 1 and 3, as described above. Ohashi et al. does not explicitly teach that the polysiloxane emulsion contains less than 2% of cyclic siloxanes. However, Dalle et al. teaches that the presence of volatile cyclic polydimethylsiloxanes (such as octamethylcyclotetrasiloxane), in commercially available materials is undesirable owing to recent safety and environmental guidelines (1:22-29). Ohashi et al. and Dalle et al. are combinable because they are from the same field of endeavor, namely, the emulsion of polysiloxanes having organofunctional groups and subsequent chain extension reactions of the organofunctional polysiloxanes. At the time of the invention, a person having ordinary skill in the art would have found it obvious to keep the levels of cyclic volatile siloxanes as low as possible, preferably below 1% as taught by Dalle et al. when incorporating the process of Ohashi et al. and would have been motivated to do so for the reasons taught by Dalle et al. cited above. This would include removal of any volatile and cyclic organosiloxanes prior to the emulsification step as taught by Ohashi et al.

Claims 1-7 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schirosi et al. (WO 02/42360), in view of Koerner et al. (US Pat. 4,137,179).

Claims 1 and 3: Schirosi et al. teaches a process for the continuous preparation polysiloxane aqueous emulsions (abstract) which can have organic functionality (paragraph 0036). More specifically, Schirosi et al. teaches a continuous process in which a polysiloxane fluid and one or more surfactants (which may be nonionic or cationic) are mechanically emulsified using a high shear dynamic mixer in an aqueous medium (paragraphs 0024-0026). Schirosi et al. further teaches that in cases where the polysiloxane fluid [which may be a polysiloxane having silanol groups (paragraph 0037)] has reactive groups, it may undergo a chain extension reaction with the reactive organo-functional polysiloxane (paragraph 0035-0036). In such a chain extension reaction, the chain extender may be added after the mechanical emulsion of the polysiloxane fluid (paragraph 0036). In summary, Schirosi et al. teaches a process for the continuous preparation of an organo-functional polysiloxane fluid comprised of mechanically emulsifying an organofunctional polysiloxane fluid in the presence of water and one or more surfactants, and further teaches that the chain extender may be an alkoxy silane (paragraph 0037) which reacts with the organofunctional polysiloxane fluid in a continuous manner. Schirosi et al. explicitly teaches the limitations of instant claim 3 in paragraphs 0035-0036.

Schirosi et al. does not explicitly teach that the chain extender may have a functional group attached to the alkoxy silane, such as an aminofunctional group. However, Koerner et al. teaches an organopolysiloxane emulsion in which a polysiloxane diol is emulsified in the presence of water and a surfactant(s), followed by addition of an aminofunctional silane, such as

3-aminopropyltrimethoxysilane (2:45-3:44). Schirosi et al. and Koerner et al. are combinable because they are from the same field of endeavor, namely, organopolysiloxane emulsions which are based on emulsion of polysiloxane diols in the presence of water and surfactant, followed by a chain extension reaction with an alkoxysilane. At the time of the invention, a person having ordinary skill in the art would have found it obvious to employ the aminofunctional alkoxysilanes as taught by Koerner et al. into the continuous process for preparing organosiloxane emulsions as taught by Schirosi et al. and would have been motivated to do so because Koerner et al. teaches that such aminofunctional polysiloxane emulsions serve a useful purpose in that they may be used to treat wool, rendering the wool shrink-proof (abstract of Koerner et al.).

Claim 2: Schirosi et al. further teaches that the organosiloxane fluids [which may have silanol groups (paragraph 0037)] are emulsified in the presence of a non-ionic surfactant (paragraph 0011).

Claims 10 and 11: Since the organofunctional fluids taught by Schirosi et al. are taught to be substantially linear with nearly all of the functionality occurring at the polymer chain ends, and since Schirosi et al. does not teach the employment of any cyclic polysiloxanes, it follows that there is less than 2% of cyclic organosiloxanes present in the polysiloxane emulsions as taught by Schirosi et al.

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schirosi et al. (WO 02/42360), in view of Koerner et al. (US Pat. 4,137,179), as applied to claims 1 and 3

above, further in view of Dalle et al. (US Pat. 6,248,855). This is an alternate rejection to the one cited supra.

Schirosi et al., in view of Koerner et al., collectively teach the limitations of instant claims and 1 and 3, as described above. Schirosi et al. does not explicitly teach that the polysiloxane emulsion contain less than 2% of cyclic siloxanes (although the absence or near absence of such cyclic siloxanes is believed to be present in the teachings of Schirosi, as described above). Nevertheless, if it is the Applicant's position that there is insufficient teaching in Schirosi et al. and Koerner et al. that the limitations of instant claims 10 and 11 are satisfied, Dalle et al. teaches that the presence of volatile cyclic polydimethylsiloxanes (such as octamethylcyclotetrasiloxane) in commercially available materials are undesirable owing to recent safety and environmental guidelines (1:22-29). Schirosi et al. and Dalle et al. are combinable because they are from the same field of endeavor, namely, the emulsion of polysiloxanes having organofunctional groups and subsequent chain extension reactions of the organofunctional polysiloxanes. At the time of the invention, a person having ordinary skill in the art would have found it obvious to keep the levels of cyclic volatile siloxanes as low as possible, preferably below 1% as taught by Dalle et al. when incorporating the process of Schirosi et al. and would have been motivated to do so for the reasons taught by Dalle et al. cited above. This would include removal of any volatile and cyclic organosiloxanes prior to the emulsification step as taught by Schirosi et al.

Relevant Art Cited

The prior art made of record and not relied upon but is considered pertinent to applicants disclosure can be found on the attached PTO-892 form.

Response to Arguments

Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Loewe whose telephone number is (571) 270-3298. The examiner can normally be reached on Monday through Friday from 5:30 AM to 3:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner, Art Unit 1796
10-Jun-08

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